Section V
Appendix

DESCRIPTION OF ACS-2000 SERIES

The ACS-2000 Series is a specially designed animation control computer. It is both a playback and programming control unit. Depending upon your specific application, your ACS-2000 may be configured at the factory to control 32, 64 or 128 channels or circuits.

Each channel is a separate circuit which can be turned on or off by the computer. Thus the ACS is capable of controlling up to 128 digital movements or special effects or any combination. The ACS-2000 also can be configured to control up to 16 analog functions. Those control channels may be attached to such things as an animated character's cylinders, lighting circuits, curtain motors, smoke machines or any variety of devices needing to be synchronized with the animatronic production.

In addition, the ACS-2000 can either automatically or manually control the operation of the audio equipment such as starting, stopping and rewinding a tape recorder.

The ACS-2000 also features a motion sequencer, *AutoVox*--a voice-activated movement control, clock, and a between-show timer. Each of those functions are described below.

The ACS-2000 Series is composed of two separate units--*CPU* and *Keyboard/Display*. Figure II-1 depicts the *Active Program Display* which appears in the upper left of the separate keyboard unit. Figure II-2 shows the general keyboard functional layout.

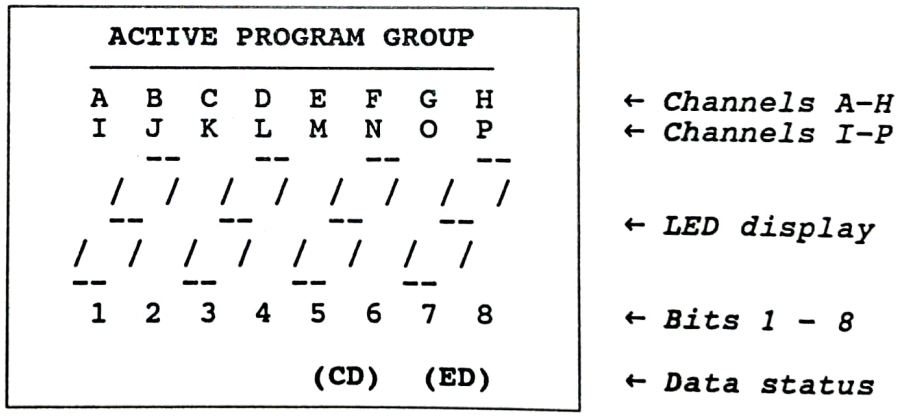

Figure II-1. ACS-2000 Display Panel

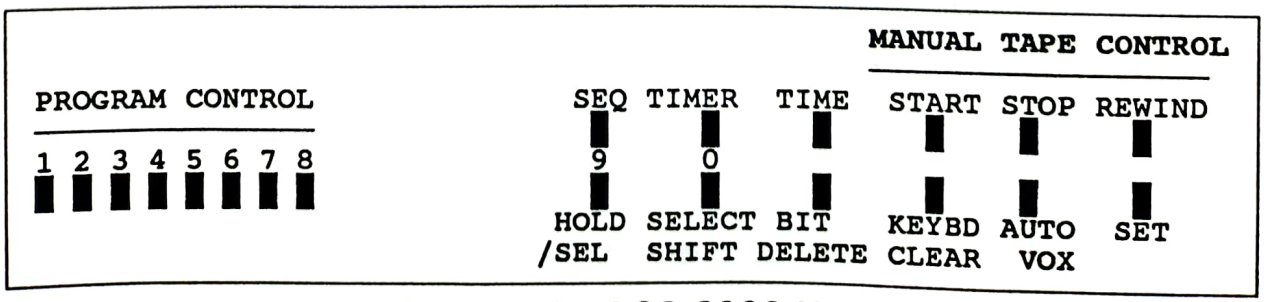

Figure II-2. ACS-2000 Keyboard

- **CPU UNIT:** The main housing contains the central processing unit (CPU), output channel switching cards, power supplies, and an audio decoder. The unit may be self-contained in its own cabinet or mounted in a standard 19-inch equipment rack.

- **KEYBOARD/DISPLAY:** The separate keyboard contains switches or buttons (*Program Control* keys) to set or control various functions of the ACS. There is also a display panel (*Active Program Display*) which visually shows in real time what functions are being activated or controlled.

■ ACTIVE PROGRAM DISPLAY

The upper left portion of the ACS-2000 keyboard displays the *Active Program Group*. This segmented LED display illustrates what channels are being activated by the ACS. In addition, two key indicator lights report the status and condition of the synchronization data being received from the audio source. The *Carrier Detect* (CD) and *Error Detect* (ED) indicators report to the operator if the incoming data is suitable for decoding. (See *Carrier Detect* and *Error Detect* below)

The 128 control bits are segmented into 16, eight-bit channels identified by the letters A-P. The *Active Program Group* letter is a backlighted LED segment.

■ PROGRAM CONTROL KEYS

On the lower left side of the ACS-2000 keyboard are eight buttons referred to as ***Program Control*** keys. These buttons activate each show signal and perform other functions which are discussed later.

On the lower right side of the keyboard are two rows of buttons that determine the ACS-2000 operation mode. Each button or switch has a specific function, e.g., sequencing, automatic mouth control, manual audio source control, etc. These functions are discussed in detail later.

The *Program Control* keys activate the eight bits of whichever channel you have selected. Consult your *Grid Sheet* in the *Appendix* to determine the specific assignments for your system.

- **Carrier Detect**
  If the ACS-2000 and the audio source are connected properly, the ***CARRIER DETECT (CD)*** light on the upper panel illuminates. This light illuminates whenever the ACS is receiving properly formatted information from the audio source for decoding.

- **Error Detect**
  If the ***ERROR DETECT (ED)*** light illuminates, this means the data being received by the ACS is unintelligible and cannot be decoded properly. Check cable connections on the rear of the ACS and the audio source. Verify that the tape or audio source has valid information.

MANUAL TAPE CONTROL

The tape recorder or other audio source may be remotely controlled manually from the ACS-2000 operating panel. Here is a description of what each switch performs.

STOP will stop the audio source and the program.
START will start the audio source and the program.
REWIND will stop the program and start the rewinding of a tape recorder.

These same switches may be assigned to perform similar functions for non-audio tape sources.

TIME OF DAY

▪ VIEWING THE TIME OF DAY

Press the *TIME* button. The switch latches on and the LED remains lighted. The time is displayed on the *Active Program Group* Panel. It is a good preventative maintenance procedure to check the clock periodically to determine its accuracy or possible battery failure.

▪ SETTING THE TIME OF DAY

Setting the time of day should be done upon the initial installation. Normally it is not necessary to reset the ACS-2000's internal clock because the clock is protected by a back-up battery.

Note: Be sure the *SEQ*uencer and *TIMER* buttons are NOT depressed.

Depress the *TIME* and *SET* buttons. The LED on each button activates, and the keyboard/display panel reads: *0000*.

Using the *Program Control* keys, enter the time in hours and minutes (Note: use the *HOLD/SEL*ect and the *SELECT/SHIFT* keys for the numerals *9* and *0*, respectively). The time must be entered in military time, using a 24 hour clock.

Example: 2:50 pm is 14:50 hours. It is entered by using *Program Control* keys *1,4,5,0*.

Once the time is set, depress the *SET* button again to unlatch it, and the clock begins keeping the newly set time.

TIMER

The *TIMER* sets the length of time from the end of a program to the beginning of the next program. It can be set for any length of time up to 59 minutes and 59 seconds. The timer is activated whenever the *TIMER* button is depressed and the LED indicator on the button is lit. The timer begins its countdown when the audio source is stopped or in rewind. The audio source is automatically started when the countdown is complete. When the audio source stops again or goes into rewind, the counter will re-set and resume its count.

NOTES:

1. **The *Time of Day* must be set before the *Timer* will function.**
2. **When setting the timer, be sure to allow enough time for the tape to completely rewind or for the audio source to reset. Otherwise, the program will not start at its beginning.**

▪ SETTING THE TIMER

Be sure the *SEQ*uence button is **NOT** depressed. Otherwise, you will be setting the sequencer rather than setting the timer.

Depress the *TIMER* and *SET* buttons. The LED on each button activates and the keyboard/display panel displays: *0000.*

Using the *Program Control* keys, enter the desired time in minutes and seconds between show segments. **(Note: Use the *HOLD/SEL*ect and the *SELECT/SHIFT* buttons for the numerals *9* and *0*, respectively).**

Release the *SET* button. When the *TIMER* button is activated, the timer runs whenever the computer is not receiving data from the audio source. The timer issues a *START* command to the audio source after the preset time has lapsed.

Example: If the desired time between shows is 12 minutes and 45 seconds, enter *1,2,4,5*

RUNNING A PRERECORDED SHOW

Note: Before attempting to start a program turn on all electric power to the ACS-2000, audio equipment and air compressor.

AUDIO TAPE SOURCE

To playback a prerecorded tape place the cassette tape in the tape recorder or thread the reel-to-reel tape (See instructions for playing tape on your specific equipment in the *Appendix* of this manual). Press the *play* button on the tape recorder and observe the *(CD)* and *(ED)* lights on the display panel once the tape has sufficiently reached the recorded material. (See below)

OTHER AUDIO SOURCES

If your audio source is something other than a tape recorder, the principle remains the same. After the data channel is connected to the ACS and the other audio channels connected to amplifiers and speakers, then starting the audio source should produce the same results. (See the instructions for playing your specific audio source in the *Appendix* of this manual.)

LIVE OPERATION OF ANIMATION

Sally's animatronic systems not only operate from prerecorded synchronized audio but also permit manual or live operation of characters. In some instances, character's are specified to have an *AutoVox* feature which allows for automatic, live mouth movement.

The ACS-2000 can, at any time, manually operate any movement from the keyboard. This manual operation feature makes live operation easier and also permits testing and adjustment of character's after installation

▪ *AutoVox* ™

Using *AutoVox* allows you to speak into a microphone and have your voice come from the character while the character's animated mouth moves in synchronization to your words. *AutoVox* only affects the mouth movement. If you want to create other animated movements such as eye blink, head turn, arms, etc. then you should operate those movements manually from the keyboard as you speak through the

AutoVox. It is also possible to use *AutoVox* for the character's mouth movements while the rest of the character's animation comes from the prerecorded audio source. In this instance, *AutoVox* overrides any *programmed* mouth movement.

The *AutoVox* output is fed only to the character and can not be recorded onto tape during new show programming.

▸ VOXING A CHARACTER

Depressing the *AutoVox* button automatically activates this feature in the operate mode. The button latches on and the LED indicator remains lit. The *AutoVox* overrides any programmed mouth control from the audio source.

Connect a microphone to the microphone input jack on the front of the tape recorder or audio source. Use the audio channel that corresponds to the audio *input* on the rear panel of the ACS-2000.

Put a **blank** tape into the tape recorder and depress the *PLAY* and *RECORD*. **Do Not Use The Show Tape During Live Operation.**

Depress the *AutoVox* button on the ACS. When you speak into the microphone, the character's mouth operates in synchronization with the live voice. Speak clearly and distinctly. You may need to adjust the volume and the mouth response time by adjusting the *record* level on the audio source.

■ LIVE MOVEMENT CONTROL

In addition to decoding information from the audio source to control the show or character, the ACS-2000 also *encodes* information. In other words, the ACS creates the same data that would be stored in an audio source. In this way the ACS-2000 is connected directly to the character allowing it to operate all of the movements, special effects, etc., manually. This is helpful in troubleshooting problems and allows for "live" interaction with the audience.

In the *Appendix* are the movements of your characters diagramed in an *ACS-2000 Grid Sheet* form. There is also a discussion of the *Grid Sheet* below which will help you to better understand the concept. In this way you are able to look up the address of each movement or element to be controlled. Therefore, when operating or programming the show you first must identify the address of the desired movement (using the grid sheet found in the *Appendix*) by determining the channel and bit address.

NOTE: The sequencer can be used to randomly move any other characters during live operation of the designated character.

On the right side of the ACS-2000 keyboard is a group of eight buttons referred to as *Program Control* keys. These eight buttons correspond to the eight bits of the matrix (see Figure II-1). By depressing these buttons, you activate bits 1-8 for whatever channel is active. The *Active Program Group* panel, located on the ACS-2000 upper keyboard, displays the active channels.

The uppermost section of the panel has two rows of letters (A-H and I-P) which refer to the *channels* of the matrix labeling system. The active channel is backlighted by an LED.

The *Program Control* keys may be pushed individually or at the same time.

▪ CHANGING THE CHANNEL

The ACS-2000 allows you to select any channel for operation. To change the channel, the *HOLD/SELect* and *SELECT/SHIFT* buttons are used simultaneously with the *Program Control* keys. When the *HOLD/SELect* button is depressed, the *Program Control* keys correspond to the upper channels, A-H. When both the *HOLD/SELect* and the *SELECT/SHIFT* keys are depressed, the *Program Control* keys correspond to the lower channels, I-P.

Selecting Channels A-H:

First depress and hold the *HOLD/SELect* key, then depress the *Program Control* key from 1 to 8 corresponding to the A to H channel. The display changes to the channel you selected.

The Lower 8 Channels

First depress and hold the *HOLD/SELect* and *SELECT/SHIFT* buttons, then depress a *Program Control* key from 1 to 8 corresponding to the I to P channel. The display changes to the channel you selected.

▪ GRID SHEET

Before you can operate the character or show, the movements (or other elements) must be identified in a manner that the ACS can understand. Consequently, a grid system is used to label each control element. Think of this grid as an unique address for each movement or control channel.

The 128 maximum outputs comprise a grid of sixteen *CHANNELS* of eight *BITS* each. Each movement or action in your show is assigned a two-part address code consisting of one channel and one bit.

In this manner, each movement is assigned a two bit address that can be understood by the ACS-2000.

BITS

CHANNELS	1	2	3	4	5	6	7	8
A	HEAD NOD							
B			EYE TURN					
C						ARM OUT		

Figure II-3. Sample ACS-2000 Grid Map

In the above example, the *Grid Sheet* indicates that the address for the character's head turn movement is Channel *A*, Bit *1*. Also on this matrix you will note that *B3* represents the eye turn movement and *C6* is the address for the character's arm-out motion.

SEQUENCER

The sequencer is a built-in ACS-2000 memory feature. It allows the characters to continue to move in a life-like manner whenever the ACS is not receiving a data from the audio source. The sequencer prevents the characters from going "dead" while the audio source is resetting or stopped.

Any of the 128 functions can be stored in the sequencer. You can program 30-seconds of movements and store the sequence in memory. When the audio source stops sending prerecorded data, then the sequencer takes over and keeps the characters moving according to the stored sequence. This sequence is repeated over and over until the audio source starts sending data again or the sequencer is turned off.

▪ ACTIVATING THE SEQUENCER

To activate the sequencer, depress the *SEQ* button on the ACS-2000 front panel. The button latches on and the LED illuminates.

The prerecorded data received from the audio source overrides *SEQ* programmed information.

▪ PROGRAMMING THE SEQUENCER

Select the channel you want to program in the same manner described in the *Changing the Channel* section above.

Depress the *SEQ* button; the LED illuminates. Depress the *SET* button; the LED illuminates. You are now ready to program the sequencer.

- Depress the *Program Control* buttons in the order you want the character to move. Program additional channels by selecting that channel and repeating the programming steps described above.

- You may continue to program additional information into the sequencer program indefinitely. None of the information programmed into the sequencer is erased, even if you continue beyond the 30 second repeat cycle. Thus, you can add different channels and bits of information on each 30 second cycle.

- After you have programmed a number of passes through the cycle, it's likely you may want to eliminate or edit some of the channels. To eliminate a particular channel, select the appropriate one as described previously and depress the *BIT DELETE* key while simultaneously depressing the *Program Control* key for the signal. This eliminates the signal from the memory of the sequencer.

- The ACS-2000 has other features that save time in the programming process. If there is a particular element you wish to activate through the entire cycle, such as a stage light or curtain, first push down and hold the selected *Program Control* key and then depress the *HOLD/SEL*ect key. The system changes to another channel and automatically continues to activate this signal until you return to this channel. You may use this feature for as many channels as desired. However, if you return to this channel to do more programming, you automatically clear any bits that are locked on. To eliminate all signals programmed in this manner, press *KEYBD CLEAR*. This eliminates all signals stored via *HOLD/SEL*ect.

≡ Depressing the *SET* key once exits the ACS-2000 from the sequencer programming mode.

The program you entered remains in memory even if you turn off the ACS-2000. The sequencer may be started by pressing the *SEQ*uence key until it illuminates. If the *SEQ*uencer button is on when you start a show, the sequencer is overridden by data from the audio source and the sequencer resumes when no data is being received.

RECORDING A PROGRAM ON TAPE

Before attempting to record a program on tape, you should first become thoroughly familiar with the procedures for live operation of the show and procedures for programming the sequencer (see *Live Operation* and *Sequencer* sections above).

Next, review the *Operations Manual* for the tape recorder included with your animation package (located in the *Appendix* of this manual). Become familiar with the section on how to record on the tape.

You learned in previous sections of this manual the ACS-2000 decodes information from the audio source into usable output signals that control the animation and other show elements. You also learned that the ACS-2000 encodes information into the sequencer or for live operation. In actuality, the ACS-2000 is simultaneously and constantly decoding and encoding information.

The remaining steps for programming onto tape use the *playback* and *record* modes of the tape recorder in conjunction with the *decode* and *encode* capabilities of the ACS-2000 to produce a tape containing the programmed data.

The diagram of the rear panel of the ACS-2000 is shown in Figure II-4 below.

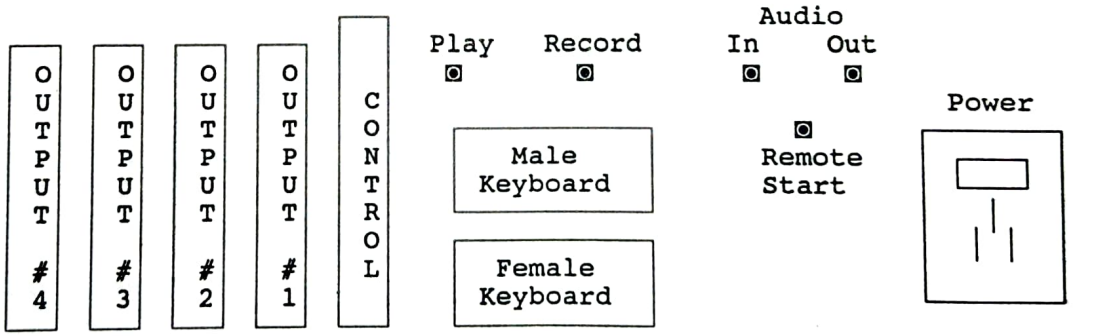

Figure II-4. ACS Rear Panel Layout

The ACS-2000 receives information from the audio source through the input connector labeled ***play*** on the ACS rear panel. A phono patch cable should be connected from this *input* to the audio source *output* for the channel (or track) holding the programmed data. Whenever the audio source is in playback mode the ACS receives and decodes any information coming from the source.

▪ MAKING AN ANIMATION DATA RECORDING

The ACS-2000 constantly outputs data through the connector labeled *record* on the rear panel of the ACS. If the ACS is processing information from a prerecorded tape, then the output is identical to the prerecorded tape. If the ACS is processing

the information from the keyboard during live operation of the show, then the output is identical to the keyboard information. If the keyboard is used while playing a prerecorded tape, then the output contains both the information on the tape and the information on the keyboard.

By connecting the *record output* from the ACS to the *input* of a tape recorder, the information can be recorded onto an audio track whenever the tape recorder and track are placed in the record mode.

The first and most important step in programming and recording data is——

MAKE SURE YOU ARE RECORDING ONTO A BLANK TRACK OF TAPE

Whenever a tape recorder is recording new data, **all previously recorded information is erased.** Always double check the cable connections between the ACS and tape recorder to ensure you will get the intended results.

MULTI-TRACK TAPE RECORDERS

Most tape recorders used with the ACS-2000 have at least three separate tracks. That is, each tape track can be separately placed into either the record or playback mode. At least one of the tape tracks stores the audio portion of the tape (music, dialogue, etc.) and only one track stores control information even though two will be used for the recording.

Determine in advance which tracks you will use for audio and control information.

For purposes of this manual, we assume a 4-track recorder is being used. Tracks 1 and 2 are assigned for program audio and tracks 3 and 4 are used for the control information (data).

- The next step in making a control tape for animation is to record the audio (music, dialogue, etc.) portion of the show onto the desired tape track(s). Refer to the user's manual of your tape recorder if you need assistance.

- Make sure the audio tracks are in the *play* mode and rewind the tape to the beginning. Play the tape and adjust the audio system amplifiers and speakers to the desired levels. Rewind the tape.

- Inspect the connections on the tape recorder and verify that the *record* connector on the rear panel of the ACS is connected to the *input* connector of track 3 of the tape recorder. Also verify that the *play* connector of the ACS is not connected to the tape track on which you will be recording. This causes the ACS to decode the same information it is encoding and consequently will "lock up" the system.

- Select the channel you want to program in the manner described in the *Live Operation* section of this manual.

- Place track 3 of the tape recorder in the record mode and start the tape.

- Depress the *Program Control* keys corresponding to the *bits* of the desired movement or action. Change *channels* as desired to access other movements or control signals. Continue programming until you reach the end of the audio

portion of the tape. All information keyed in via the keyboard is recorded onto the tape.

≡ Disengage the *record* function on track 3 and rewind the tape to the beginning. Verify that the *output* connector of track 3 is connected to the *play* connector on the rear panel of the ACS, and play back the information you have just recorded. If the show does not duplicate the movements you programmed, verify your cable connections and tape recorder settings.

Once you have made a pass through the system, you may want to add other movements to those you recorded. Because the ACS can simultaneously decode and encode, this can be accomplished by following the instructions below.

▪ ADDING MOVEMENTS

To add movements to the program, the *output* connector from track 3 of the tape recorder should be connected to the *play* connector at the back of the ACS-2000. In addition, the *record* connector on the back of the ACS should be connected to the *input* for track 4 of the tape recorder.

≡ Make sure that only track 4 is in the record mode and begin the tape.

≡ Depress the *Program Control* keys that correspond to the *bits* of the desired movement or action.

≡ Change channels as desired to access other movements or control signals.

≡ Continue programming until you reach the end of the audio portion of the tape.

≡ **Disengage the *Record* mode on the tape recorder** and rewind the tape.

The information on track 3 of the tape was decoded by the ACS, combined with the information added via the keyboard, and output onto track 4 of the tape recorder. This process is known as "ping ponging."

≡ Play back the data on track 4 by connecting the *output* of track 4 to the *play* connector of the ACS-2000

If you desire to add more information to the tape, repeat the procedure by playing back the information from track 4 and recording the newly combined information onto track 3, and so forth. However, there are two things to remember:

1. Always verify that the play back track contains good data before recording over a previous track.

2. Double-check your cables before recording.

▪ HOLDING/SELECTING A CHANNEL

The ACS-2000 has other features that save time in the programming process. If there is a particular control element you wish to activate through the entire cycle, such as a light, first push down and hold the selected *Program Control* keys and then depress the *HOLD/SELECT* key. The system changes to another channel and automatically continues to activate this signal until you return to this channel. You may use this feature for as many signals as desired. However, if you return to this channel to do more programming, you automatically clear any other locked on bits.

To eliminate all signals that are input using the *HOLD/SELECT* button, press the *KEYBD CLEAR*. This eliminates all signals stored via the *HOLD/SELECT*.

- **DELETING MOVEMENTS**

After you have programmed a number of passes through the cycle, it is likely that you may want to eliminate some of the signals. To eliminate a particular signal, select the appropriate channel as described previously and depress the *BIT DELETE* key while simultaneously depressing the *Program Control* key for the signal. This eliminates the signal from the tape.

Section III
Installation

INSTALLING THE SYSTEM

EQUIPMENT LOCATION

The location to the animated characters and associated control equipment to run your animatronic system are an important factors in achieving reliability and serviceability. If you have doubts about the location selected to house the characters or equipment, you should contact the Sally *Customer Service Department*.

▪ CHARACTERS

Animated characters should be kept out of direct sunlight and in generally dry environments.

Ultraviolet light may cause skin and costume fading as well as general material deterioration.

Moisture can also be damaging by creating mold and mildew, rust and corrosion.

Generally, characters should be anchored to the floor, stage or some other structure to stabilize the figure and provide a better performance.

▪ ELECTRONIC EQUIPMENT

The electronic equipment, e.g., ACS, audio source, amplifiers, etc. should also be kept out of direct sunlight and away from moisture and dampness.

Furthermore, such electronic equipment should be kept in relatively dust-free areas to avoid damage to switches, controls, relays, tape recorder playback and record heads, etc.

Cable lengths should generally not exceed 100-feet; the shorter, the better. Control and audio cables should be routed away from noise-producing sources such as motors, solenoids and high voltage switching circuits.

▪ AIR COMPRESSOR/DRYER

Air source equipment should also be kept in a relatively dry and dust-free area in order to reduce the amount of moisture produced during the compressor cycle and to avoid clogging delicate air valves with foreign matter.

Air lines should be tightly secured at their connectors and run on the most direct and shortest route. It is permissible for the air compressor equipment to be placed in a soundproof housing or away from the other equipment to reduce mechanical noise. However, air compressors need a well-ventilated area in which to function.

ELECTRIC POWER CONSIDERATIONS

Whenever possible the ACS and audio equipment should be isolated from electrical circuits which may have motor-driven equipment or electrical heavy surges. In other words, the ACS and audio equipment generally can share the same circuit, however, the air compressor should operate from a separate electrical circuit to reduce any possibility of interference by the electric surges created when the compressor motor is cycled on. It's also advisable that heavy stage lighting be delegated to a separate circuit.

CONTROL OUTPUTS

Because the ACS-2000 can control up to 128 channels, it therefore must have at least 128 signal wires and one common (B+) wire to operate the system. The rear panel of the ACS contains up to five output control connections, each connection containing 50 contact points. The *Appendix* of this manual shows which signal controls each specific movement or effect in your show. The output connections and the signals they control are listed in Table III-1 and the ACS-2000 back panel is depicted in Figure III-1

OUTPUT NUMBER	SIGNAL CONTROL
CONTROL	TAPE RECORDER CONTROL, MISC.
OUTPUT NUMBER 1	SIGNALS A1-A8, B1-B8, C1-C8, D1-D8
OUTPUT NUMBER 2	SIGNALS E1-E8, F1-F8, G1-G8, H1-H8
OUTPUT NUMBER 3	SIGNALS I1-I8, J1-J8, K1-K8, L1-L8
OUTPUT NUMBER 4	SIGNALS M1-M8, N1-N8, O1-O8, P1-P8

TABLE III-1. ACS-2000 Output Connector Assignments

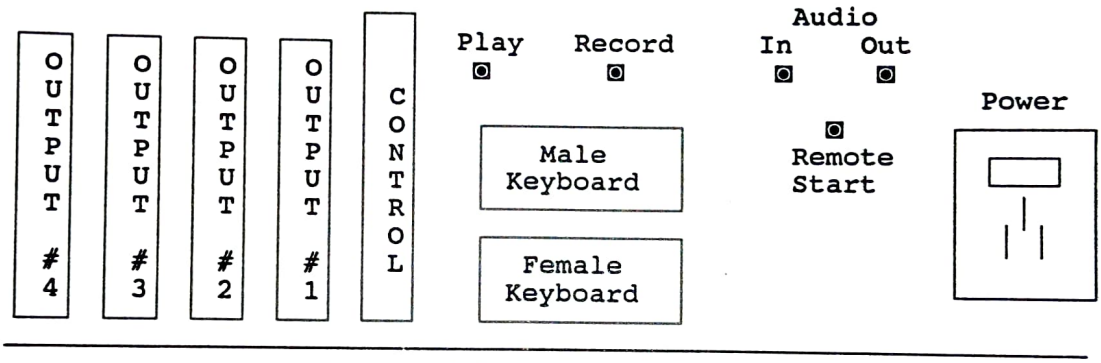

Figure III-1. ACS Rear Panel Layout

INSTALLING THE SYSTEM

Generally, the outputs from the ACS are connected directly to the characters or other controlled elements of the show. Your show equipment package includes cables designed to match these ACS connectors and provide control signals (and B+ - 24 vdc) to the show. Extension cables may be acquired through Sally, and probably locally, in the event more distance is needed between the ACS and show elements.

When the number of locations exceeds the four output connections (usually eight characters and four output connections), an interface panel is required. If your show has an interface panel, details will be provided in the *Appendix*.

▪ PLAY AND RECORD CONNECTORS

Your ACS decodes the information on the data channel of the audio tape. The input jack labeled *play* on the rear panel of the ACS is where the information is received by the ACS. This line should be plugged into the output of the audio source channel containing the programmed data.

To play a previously recorded program, the output from the data track on the tape deck should be plugged into the play connector on the back of the ACS.

Your ACS also has the capability to record, or input data onto tape.

WARNING: Do Not Record Onto Your Prerecorded Show Tape.

The output jack labeled *record* on the rear of the ACS, is where the new information is output to the tape recorder. A phono jack cable should be attached from this output to the input of the tape recorder for the track of tape that is to contain the coded data. When the tape recorder is put into the record mode, then the data input from the ACS will be recorded onto the tape.

▪ OTHER AUDIO CONNECTORS

The audio connectors are used in conjunction with the *AutoVox* feature of the ACS. The *AutoVox* feature causes the mouth of your character to move in synchronization with the audio during live operation.

Audio Input

The *audio input* connector on the back of the ACS supplies signal to the *AutoVox* circuit. It may be fed directly from the tape output or from the speaker output of the amplifier. One may work better than the other.

Audio Output

The *audio output* connector on the ACS back panel should be connected to the *input* of the audio amplifier which, in turn, is connected to the speakers. This connection only is used when the *AutoVox* feature is required, otherwise the audio source is connected directly to the amplifier.

Remote Start

The *remote start* input connector is for starting the system manually from a distant location. Functionally, the input is the same as the start button on the front panel of the ACS (see discussion on *tape control*). This connection can be used for any remote start mechanism including motion detectors, push buttons, etc.

Electrical Output-Switched

The rear panel also contains a standard female electrical receptacle that is only activated by the ACS. This output is rated at 120 v @ 200 watt or its non-U.S. equivalent.

Section IV
Maintenance

Air System Maintenance

COMPRESSOR AND AIR TANK

Compressed air is the main source of power for your characters and show performance equipment. If moisture is allowed into the air system, it will damage the pneumatic components.

Air compression causes water to build up in the compressor tank. If water is allowed to accumulate it may create rust and corrosion which clogs air lines, filters and the delicate valves.

In addition to damaging the pneumatic system, water in the compressor tank reduces the tank's storage capacity. This causes the compressor to run excessively and can cause motor damage.

The compressor tank should be drained of water at least weekly. If you are located in a humid area, draining should take place more frequently. See your compressor manual included in the *Appendix* to locate the release valve at the bottom of the tank. Opening this valve allows water to drain.

AIR FILTERS

The air filters should be inspected regularly and replaced when contaminated. Contamination will show up as a brown or yellow staining of the filter element.

WARNING

Even though the air compressor may be turned off, the air storage tank remains under pressure even though the compressor itself is off. Removal of components may result in serious injury. DO NOT attempt to work on compressor with open cuts or abrasions on hands or forearms. This could result in air injection under the skin. Also, use a pan or other container so that discharged water does not come into contact with the floor or any electrical connections.

Audio System Maintenance

THE TAPE MACHINE

The tape contains all the information for operation of your show. If the tape machine is not functioning properly, your show can not and will not function properly. At best, the audio quality will suffer, and at worst, the Animation Control System will be unable to decode the control information on the tape, disabling the show entirely.

The primary cause of field problems is failure to clean the tape recorder. If you fail to clean the tape recorder on a regular basis, the show performance will slowly and progressively deteriorate.

▪ CLEANING THE HEADS AND TAPE GUIDES

The tape recorder heads should be cleaned daily, and twice daily during heavy operation or during dry, dusty weather conditions.

Spray head cleaner on cotton swabs or directly onto the heads and tape guides, and thoroughly wipe off all dirt and oxide buildup.

▪ CLEANING THE PINCH ROLLER

On a cassette tape recorder remove the cassette door cover and close the cassette door. Hold down the play button so the tape deck remains in the play mode. Spray head cleaner on a cotton swab or directly onto the pinch roller and lightly press the swab onto the pinch roller to the right side of the capstan shaft. This will prevent the swab from becoming entangled. Clean until there is no visible residue on the pinch roller.

▪ CLEANING THE CAPSTAN SHAFT

Activate the pause mode on the recorder and spray head cleaner on a cotton swab; lightly press the swab onto the rotating capstan shaft. Clean until there is no visible residue on the capstan shaft.

Art and Costume Maintenance

Sally uses a variety of materials for creating skins. Most human character faces are made of a proprietary blend of silicone. Some special skins are made from urethane and vinyl. Animal character skins, including faces, are usually made of latex.

SILICONE FACES

Avoid touching the silicone face. The oils in your hand may remove makeup.

When cleaning the faces, brush off any dust with a soft brush, then very gently pat with a damp soft cloth.

▪ MAKE UP

Usually the colors that are used are common cosmetic powder make-ups to create a matte finish. If you re-apply makeup be sure to strive for a natural, non-shiny look to avoid having the character appear to look wet or plastic. Apply face powder with a soft brush using common makeup techniques.

If you need to remove the make-up, use alcohol or acetone and a soft cloth.

▪ REPAIRING SILICONE TEARS

(We recommend that this repair be performed by Sally Industries.

1. Clean surface to be repaired with water and mild soap. Rinse thoroughly.
2. Dry surface.
3. Using T-pin, place some silicone on the inside of the tear (wipe excess off of outer surface).
4. Close the tear (if necessary, use small straight pins to hold tear.
5. Allow 15-20 minutes to cure.
6. Cut a piece of muslin (cotton cloth) larger than tear.
7. Attach muslin to the inside of the mask (behind the tear) with silicone.
8. Mix a small amount of colorant with some silicone.
9. Spread over the outside surface of the repair.
10. Put finger cot on and dip in alcohol.
11. Even out the layer of silicone with finger.
12. Dip make-up sponge in alcohol and pat layer of silicone.
13. If surface is shiny after the repair has cured, cover with powder make-up.

VINYL HANDS

To clean vinyl hands - use mild soap and water with a soft cloth.

Do not allow any print or dyes near the hands because they will absorb the stains.

SKIN FLEX FACE AND HANDS

Clean gently with mild soap, e.g., Joy, and water using soft cloth. Keep out of sunlight.

To repair tears use 3M Brand CA-40 super glue made for rubber materials. Do not let costume or anything continually rub against this material.

LATEX

Wash with soap and water.

Worn spots can be covered with touch up paint.

Do not let this material continually rub against anything.

COSTUME CARE

Depending on the particular style of costume on your character, you will usually find velcro closures on the back side of the costume. If the character lifts off its stand, there probably won't be any velcro on the lower part of the costume. Send to dry cleaners for cleaning.

WIG CARE

Keep wigs brushed regularly. This keeps them from looking droopy from moisture or dust. If your character has a styled wig, pin up any fallen hair and spray with Krylon Crystal clear or heavy hairspray.

FURS: Artificial Fur

1. Avoid continuous, direct sunlight on the fur. Fur will usually fade under direct ultraviolet or sunlight.
2. Dust fur regularly depending upon the conditions of the environment.
3. Use a feather duster, dry cloth or blow off with an air hose.
4. Fur can usually be washed with a damp cloth.
5. If fur is very dirty, dust off and then clean with a carpet cleaner such as *Glory*. Rub with damp cloth and then with a dry cloth instead of vacuuming. Vacuuming is not recommended if the fur has painted shadows or highlights.

Real Fur

1. The most important factor in keeping real fur clean is to keep dust from accumulating on the fur. This can be accomplished by blowing off the character once or twice a month using approximately 50-60 psi of air pressure. If an air hose is not available, then a feather duster can be used.
2. **DO NOT** use water or allow the character to be exposed to a moist environment.
3. Eyes and mouth may be cleaned with a damp or dry, soft cloth. Do not use any chemicals or detergents on real fur.

FEATHERS

Dust with feather duster or soft paint brush. Always dust with the grain of the feathers. If feathers get ruffled, use hair spray and carefully brush into place. While not fragile, feathers still can be bent or pulled out if mistreated.

SALLY INDUSTRIES, INC.

Animation Control System Grid Sheet

32k Memory

PROJECT CELEBRATION STATION

NAME 1 JETHRO P. HOGG **DATE** DECEMBER 18, 1991

NAME 2

NAME 3

CARD	1	2	3	4	5	6	7	8
A	EYES LEFT	EYES RIGHT	EYES BLINK	EYE BROWS UP	HEAD TURN LEFT	HEAD TURN RIGHT	HEAD NOD	STOP
B	HEAD TILT RIGHT	LEFT ELBOW DOWN	LEFT ARM FRET	RIGHT FOOT TAP	MOUTH	RIGHT ELBOW UP	RIGHT WRIST DOWN	
C	RIGHT ARM OUT							REWIND
D								

JETHRO_GS.WK1/FMT

SALLY INDUSTRIES, INC.

Animation Control System Grid Sheet

24K Memory

Project CELEBRATION STATION

Character 1 JETHRO

Character 2

Character 3

DATE DECEMBER 18, 1991

CARD	1	2	3	4	5	6	7	8
A	EYES LEFT	EYES RIGHT	EYES BLINK	EYE BROWS UP	HEAD TURN LEFT	HEAD TURN RIGHT	HEAD NOD	STOP
B	HEAD TILT RIGHT	LEFT ELBOW DOWN	LEFT ARM FRET	RIGHT FOOT TAP	MOUTH	RIGHT ELBOW UP	RIGHT WRIST DOWN	
C	RIGHT ARM OUT							REWIND

Animation Control System Grid Sheet

PROJECT CELEBRATION STATION — 128k Memory — DATE DECEMBER 18, 1991

NAME 1 Daniel
NAME 2 Col. Beau
NAME 3 Scratchmo
NAME 4 Jethro
NAME 5
NAME 6
NAME 7
NAME 8
NAME 9

CARD	1	2	3	4	5	6	7	8
A	4 Eyes Left	4 Eyes Right	4 Eyes Blink	4 Eyes Brows Up	4 Head Turn Left	4 Head Turn Right	4 Head Nod	STOP
B	4 Head Tilt Right	4 Left Elbow Down	4 Left Arm Fret	4 Right Foot Tap	4 Mouth	4 Right Elbow Up	4 Right Wrist Down	MIBx/ B-Day Sign
C	4 Right Arm Out	Lgt#1 Pig Spot	Lgt#2 Whit Wash	Lgt#3 Red Wash	Lgt#4 Blue Wash	House Control	Pig Curtain	Rewind
D	U15 Lgt#1 Beau Spot	Lgt#2 Scratch Spot	Lgt#3 Daniel Spot	Lgt#4 White Wash	Lgt#5 Red Wash	Lgt#6 Blue Wash	D7 Dog Curtain	Dog Set Lights
E	1 Eyes Left	1 Eyes Right	1 Eyes Blink	1 Head Tilt Left	1 Head Tilt Right	1 Head Nod		
F	1 Head Left	1 Head Right		1 Left Arm Out	1 Mouth	1 Left Elbow Up	1 Left Wrist Up	
G	1 Right Elbow Up	1 Right Arm Out	1 Left Rib	1 Right Rib	1 Waist Left			
H								
I	2 Eyes Left	2 Eyes Right	2 Hat Up	2 Head Tilt Left	2 Head Titl Right	2 Head Nod	2 Head Left	2 Head Right
J	2 Left Arm Fret	2 Left Elbow Down	2 Right Arm Out	2 Right Elbow/ Wrist	2 Mouth	2 Left Rib	2 Right Rib	2 Sway Right
K	2 Left Foot Tap							
L								
M	3 Eyes Left	3 Eyes Right	3 Eyes Blink	3 Head Tilt Left	3 Head Tilt Right	3 Head Nod	3 Head Left	3 Head Right
N	3 Left Shoulder Up	3 Left Arm Out	3 Left Elbow Up	3 Left Wrist Out	3 Mouth	3 Right Shldr. Up	3 Left Rib	3 Right Rib
O	3 Sway Right	3 Left Foot Tap	3 Right Arm Out					
P								

CSGS.WK1/FMT OCT '91

select shift D7

SALLY INDUSTRIES, INC.

ACS–1000/2000 SERIES

50–Pin Connector Assignments

Project: CELEBRATION STATION

Character: DANIEL

Date: DECEMBER 18, 1991

Output Connector #2

Output	1	2	3	4
W	A	E	I	M
X	B	F	J	N
Y	C	G	K	O
Z	D	H	L	P

(Channels)

Y	B+ (White)		26 »	« 1	B+ (White)		**W**
Bit 1	Right elbow up		27 »	« 2	Eyes left		Bit 1
Bit 2	Right arm out		28 »	« 3	Eyes right		Bit 2
Bit 3	Left rib		29 »	« 4	Eyes blink		Bit 3
Bit 4	Right rib		30 »	« 5	Head tilt left		Bit 4
Bit 5	Waist left		31 »	« 6	Head tilt right		Bit 5
Bit 6			32 »	« 7	Head nod		Bit 6
Bit 7			33 »	« 8			Bit 7
Bit 8			34 »	« 9	Stop		Bit 8
Z	B+ (White)		35 »	« 10	B+ (White)		**X**
Bit 1			36 »	« 11	Head left		Bit 1
Bit 2			37 »	« 12	Head right		Bit 2
Bit 3			38 »	« 13	Left shoulder up		Bit 3
Bit 4			39 »	« 14	Left arm out		Bit 4
Bit 5			40 »	« 15	Mouth		Bit 5
Bit 6			41 »	« 16	Left elbow up		Bit 6
Bit 7			42 »	« 17	Left wrist up		Bit 7
Bit 8			43 »	« 18			Bit 8
Audio Source Control	B+ (White)		44 »	« 19	B+ (White)		**Audio Source Output**
	Start		45 »	« 20	NC		
	Rewind		46 »	« 21	NC		
	Stop		47 »	« 22	Speaker Common		
	Pause		48 »	« 23	Speaker Output 1		
	Common		49 »	« 24	Speaker Output 2		
	GROUND		50 »	« 25	GROUND		